Executive Summary

Introduction

The Air Resources Board's proposed State Strategy for California's 2007 State Implementation Plan (SIP) is a comprehensive strategy designed to attain federal air quality standards through a combination of technologically feasible, cost-effective, and far reaching measures. It describes the scope of the State's ozone and fine particulate matter (PM2.5) nonattainment problems and presents ARB staff's recommendations on how California can comply with federal standards. The proposed strategy will be considered for adoption by ARB's Governing Board on June 21-22, 2007.

Under State law, ARB has the responsibility to develop SIP strategies for mobile sources and consumer products, to coordinate SIP strategies with the Bureau of Automotive Repair (BAR) and Department of Pesticide Regulation (DPR), and to oversee local district programs for stationary sources.

The 2007 SIP is the first plan designed to show how California will meet the federal 8-hour ozone standard – it represents a transition from the less stringent 1-hour standard that was the benchmark for previous SIPs. Since the new standard is more stringent, the U.S. Environmental Protection Agency (U.S. EPA) set presumptive deadlines that allow more time for attainment. Nonetheless, the measures California has adopted to meet the 1-hour standard remain in place and will deliver substantial new reductions over the next few years. These measures have enabled San Diego, Ventura, Santa Barbara, and the San Francisco Bay Area to meet the 1-hour ozone standard.

The benefits of California's mobile source control program are evident and serve as the foundation for this new State Strategy. For example, the mobile source regulations already in place will reduce today's emissions from passenger vehicles and heavy-duty trucks another 50 percent by 2015. The ARB staff's proposed State Strategy would further accelerate the reductions. Staff's proposed State Strategy addresses three key mobile source issues: the need to clean up the legacy diesel fleets, the national and international nature of many diesel fleets, and limitations on SIP credit for unsecured funding.

The proposed State Strategy, in combination with local actions, would provide emission reductions necessary to the meet 8-hour ozone standard in the two most challenging regions -- the South Coast Air Basin and the San Joaquin Valley. The State Strategy is also necessary, in whole or part, for the Sacramento region, Ventura, and several locations downwind of urban areas. Ozone SIPs are due to U.S. EPA in June 2007.

The State Strategy provides reductions needed for PM2.5 attainment in the South Coast and expected to be necessary for the San Joaquin Valley. PM2.5 SIPs for these two regions are due in 2008.

Adoption of the State Strategy by the Board would create an enforceable commitment for new emission reductions by the attainment deadline for each region. These commitments reflect the proposed attainment deadlines of 2024 for ozone for the South Coast and San Joaquin Valley and a deadline of 2015 for PM2.5. As in past SIPs, staff has estimated the expected emission reductions from various measures and a schedule for Board consideration. The Board retains the ability to modify staff proposals and achieve the necessary reductions through other measures or mechanisms.

This proposal includes aggregate emission reduction commitments for 2014 for South Coast and San Joaquin Valley PM2.5, and for 2020 and 2023 for South Coast and San Joaquin Valley ozone. The commitments precede the attainment deadline by one year in order to comply with federal SIP requirements. Staff may propose additional commitments for Board consideration in the future to the extent necessary. A PM2.5 SIP is under development by the San Joaquin Valley District and on track for adoption in 2008. The South Coast has proposed early adoption of a PM2.5 SIP in parallel with the ozone SIP due this year.

The 2023 commitment for ozone includes the long-term emission reductions needed for ozone attainment in the South Coast and San Joaquin Valley under the "new technology" provisions of the Clean Air Act (section 182(e)(5)). Staff proposes that ARB take on the full legal commitment for these reductions with the understanding that advances in technology for sources under local air districts' jurisdiction should contribute to future reductions. Until new mobile and stationary technologies become available, we propose to defer the issue of how to apportion long-term emission reduction obligations among responsible agencies. This issue will be revisited in future SIP updates. In the meantime, ARB would be responsible for all the long-term reductions upon SIP approval.

Proposed Mobile Source Strategy

The mobile source strategy has two distinct components – more stringent standards for new engines and cleanup of existing fleets. For passenger vehicles, ARB's Low Emission Vehicle Program ensures that new vehicles entering the fleet are exceptionally clean. The challenge is maintaining low emission levels over time and getting the oldest, dirtiest remaining vehicles off the road as soon as possible. The State Strategy proposes improvements to Smog Check and expansion of vehicle scrap programs to achieve these goals.

The biggest mobile source challenge is cleaning up legacy fleets of diesel engines – including trucks, construction and farm equipment, ships and locomotives. Emissions of NOx (nitrogen oxides) from diesel engines contribute to both ozone and PM2.5 levels. Emissions of SOx (sulfur oxides) from ships are a significant contributor to PM2.5 levels. Directly emitted particulate matter from diesel engines contributes to PM2.5 levels. ARB has adopted a number of measures to reduce emissions from diesel fleets under ARB's 2000 Diesel Risk Reduction Plan and 2006 Goods Movement Emission Reduction Plan.

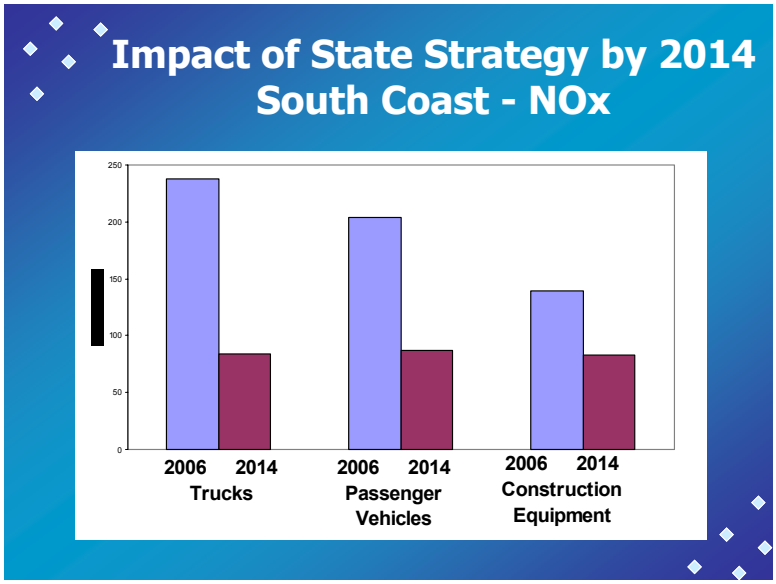
The proposed State Strategy would incorporate measures from these plans into the California SIP. This includes new measures for port trucks, statewide truck fleets, ships traveling and in port, locomotives, and harbor craft. These measures would accelerate introduction of newer, cleaner engines and, where available, require retrofit controls. The cost of these measures will be in the billions of dollars but these reductions are necessary to meet air quality standards and reduce the health and economic impacts of air pollution in California.

The mobile source reductions rely primarily on regulatory actions by ARB, BAR, and U.S. EPA. International actions to require cleaner new ship engines and retrofits are also part of the longer-term strategy. Actions by the ports and private sector and public funding would complement the regulatory strategies. However, the enforceable SIP obligation to achieve the specified emission reductions would rest with the Board.

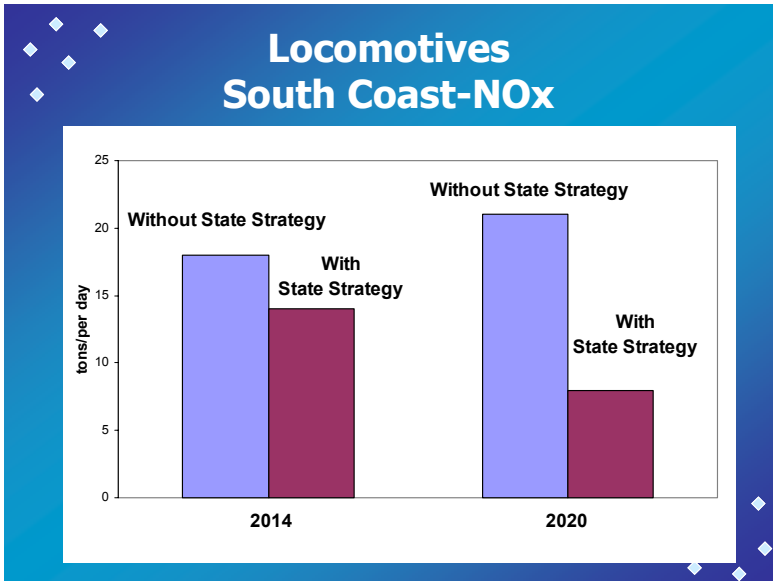
The Board's authority to regulate mobile sources varies by category and circumstance. Under California law, the Board can set new engine standards for mobile sources, but federal preemptions and practical limitations apply to many diesel engines categories. For example, under the federal Clean Air Act, only U.S. EPA can set new engine standards for locomotives and construction and farm equipment equipped with off-road engines less than 175 horsepower. In the case of new heavy-duty diesel trucks and other new and in-use off-road engines, ARB may establish emission standards, but must obtain a waiver/authorization from U.S. EPA before it can enforce such regulations. The interstate nature of trucking makes national standards for new trucks a practical necessity. While not admitting preemption, we recognize that U.S. EPA has the responsibility to represent California's interests in the international standard setting process for ocean-going ships. In short, ARB must rely on the federal action to set the new technology standards that form much of the basis for ARB staff's proposed measures to accelerate cleanup of legacy diesel fleets.

The timing of federal standards is an important part of the picture. California can only accelerate the introduction of cleaner technology once cleaner engines are available. The cleanest NOx standards phase in for trucks in 2010 and between 2013-2017 for various types of construction and other off-road equipment. U.S. EPA has proposed more stringent NOx standards for new locomotives that would begin in 2017. ARB staff continues to make the case that these standards need to be implemented prior to 2014. While the interim standards now in place are contributing to current progress, the magnitude of the reductions needed in the South Coast and San Joaquin Valley will ultimately require the cleanest technology in every diesel engine application.

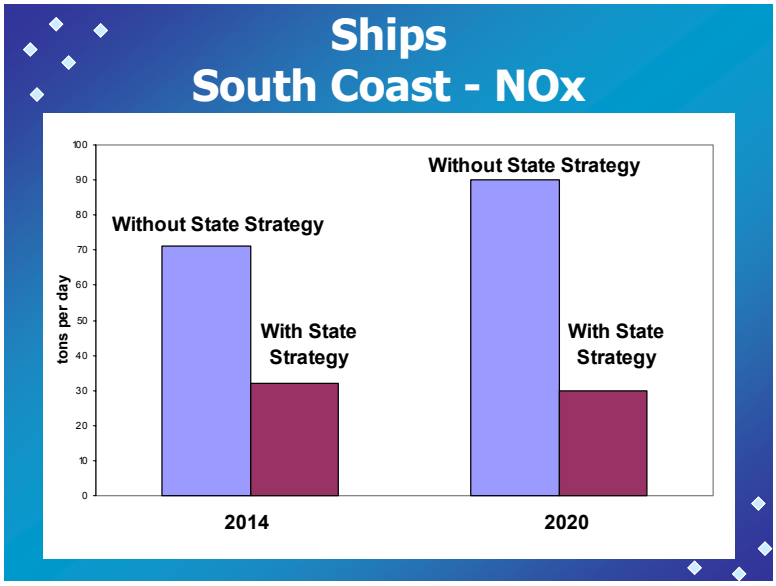
The proposed mobile source strategy and SIP commitments are described in Chapter 3. Individual measures are described in more detail in Chapter 5. The figure below shows the decrease in emissions for passenger vehicles, heavy-duty trucks, and construction equipment between now and 2014 with the proposed State Strategy. Due to increasingly more stringent mobile source controls, emissions from these categories are all on a downward trend, despite growth in population, travel, and the economy. The new measures in the proposed State Strategy would accelerate these emissions reductions. ARB staff is proposing an aggressive new emission reduction commitment of 122 tons per day of NOx reductions in the South Coast by 2014 in order to meet the region's PM2.5 attainment needs. This would bring the total mobile source NOx reductions achieved between 2006 and 2014 to about 450 tons per day.



In contrast to passenger vehicles, trucks, and construction equipment that show substantial emission decreases with natural fleet turnover, locomotive and ships show an increase in emissions without the proposed State Strategy. Locomotive emissions have been decreasing in the South Coast due to the accelerated introduction of the cleanest current technology (Tier 2). However, as shown below, growth overtakes this benefit by 2014. The proposed State Strategy includes a measure to accelerate introduction of the next generation of clean technology once U.S. EPA adopts its proposed new Tier 4 standards. The 2014 benefits assume Tier 4 engines becoming available in 2012. The 70 percent reduction projected for 2020 is based on the proposed measure to accelerate the introduction of Tier 4 locomotives to California.



Ocean-going ships show an even greater increase in emissions without the State Strategy. Ship engines are largely uncontrolled, and growth in goods movement through California ports will exacerbate this problem. The figure below shows the benefits of the proposed State Strategy in the South Coast.



<u>Proposed Consumer Products Strategy</u>

Consumer products are expected to become the largest source of reactive organic gas (ROG) emissions in the South Coast and the third largest source in the San Joaquin Valley by 2020. The magnitude of the emissions indicates that additional controls for this sector remain important, even though the average photochemical reactivity of the ROG emissions from consumer products is about one-third that of motor vehicle exhaust. The proposed State Strategy would continue ARB's commitment to reduce ROG emissions from consumer products.

Two new phases of control are proposed. One is under development for Board consideration by 2008 and the other between 2010 and 2012. As part of ARB's longer-term strategy, staff also proposes to explore additional market-based mechanisms to encourage the development, distribution, and purchase of cleaner, very low, or zero emitting products.

The table below shows the expected reductions from the proposed State Strategy in 2014 for South Coast and San Joaquin Valley. The benefits of the State Strategy will increase over time. The expected reductions in 2020 and 2023, along with the proposed timeframes for staff development, Board consideration, and implementation of the these measures is found in Chapter 3.

Expected Emission Reductions from Proposed New SIP Measures
(tons per day)
South Coast and San Joaquin Valley -- 2014

	South Coast		San Joaquin Valley	
Proposed New SIP Measures	**NOx**	**ROG**	**NOx**	**ROG**
Passenger Vehicles	**14.4**	**17.7**	**3.8**	**6.5**
Smog Check Improvements (BAR)	12.0	10.5	3.3	2.9
Expanded Vehicle Retirement	2.4	2.8	0.5	0.7
Modifications to Reformulated Gasoline Program	--	4.4	--	2.9
Heavy-Duty Trucks	**47.3**	**5.1**	**61.4**	**6.4**
Cleaner In-Use Heavy-Duty Trucks	47.3	5.1	61.4	6.4
Goods Movement Sources	**49.4**	**0.7**	**7.2**	**0.5**
Ship Auxiliary Engine Cold Ironing & Clean Technology	18.5	--	--	--
Cleaner Main Ship Engines and Fuel	20.0	--	--	--
Port Truck Modernization	2.0	--	--	--
Accelerated Intro. of Cleaner Line-Haul Locomotives	4.3	0.7	7.2	0.5
Clean Up Existing Harbor Craft	4.6	--	--	NYQ
Off-Road Equipment	**10.5**	**2.7**	**3.7**	**0.9**
Cleaner In-Use Off-Road Equipment (e.g.,Construction)	10.5	2.7	3.7	0.9
Cleaner In-Use Agricultural Equipment	NYQ	NYQ	NYQ	NYQ
Other Off-Road Sources	**0.4**	**6.6**	**0.1**	**3.5**
New Emission Standards for Recreational Boats	0.4	4.2	0.1	1.3
Expanded Off-Road Rec. Vehicle Emission Standards	--	2.4	--	2.2
Additional Evaporative Emission Standards	--	NYQ	--	NYQ
Vapor Recovery for Above Ground Storage Tanks	--	NYQ	--	NYQ
Areawide Sources	**--**	**12.9**	**--**	**5.7**
Consumer Products Program	--	12.9	--	3.2
Pesticides: DPR 2008 Regulation	--	NYQ	--	2.5
Emission Reductions from Proposed New Measures	**122**	**46**	**76**	**23**

NYQ = Not Yet Quantified. BAR = Bureau of Automotive Repair. DPR = Dept. of Pesticide Regulation

Locomotives measure relies on U.S. EPA rulemaking and industry agreement to accelerate fleet turnover.
Note: Emission reductions reflect the combined impact of regulations and supportive incentive programs. Emission reduction estimates for each proposed measure are shown for informational purposes only. Actual emission reductions from any particular measure may be greater than or less than the amounts shown.

Major Issues

Bump Up to "Extreme" for Ozone

There is concern that the proposed State Strategy does not provide sufficient emission reductions to show attainment of the ozone standard earlier than the deadlines proposed in the South Coast and San Joaquin Valley SIPs. Both ozone SIPs propose an "extreme" classification for the 8-hour ozone standard which sets an attainment deadline of 2024. Under the federal Clean Air Act, the extreme classification carries with it an ability to rely on as yet undefined new technologies where necessary (section 182(e)(5)).

Both regions were previously classified as "extreme" for the 1-hour ozone standard based on the severity of their ozone problem. With the transition to the more stringent 8-hour standard, these districts were classified as severe-17, with an attainment deadline of 2021 (South Coast), and serious, with an attainment deadline of 2013 (San Joaquin Valley), based solely on their ambient concentrations of ozone. In reality, both districts need more time to accomplish the substantial emission reductions required for attainment.

Air districts have the ability to request a reclassification, and in the case of a request to reclassify to "extreme," U.S. EPA must grant the request. Since such a request frames a district's attainment demonstration, ARB must also accept the reclassification request unless the Board rejects a district SIP as inconsistent with federal requirements.

The proposed reclassifications raise the issue of how the 2024 attainment deadline will affect air quality progress and the health impacts of air pollution in these regions. This is a very real concern. Accordingly, in the SIP development process considerable effort was devoted to assessing whether these bump-ups could be avoided.

ARB staff considered whether existing technologies, if applied across the board to all mobile and stationary sources, could achieve the necessary emission reductions to attain sooner. Unlike rulemaking processes, this analysis was performed for SIP development purposes without considering cost as a constraint.

The analysis showed that all diesel fleets would need to turn over to the newest engine standards that phase in between 2010 and 2017, all passenger vehicles would need to be no older than 10 years, and substantial additional reductions would be needed from new technologies for both mobile and stationary sources. The only other potential option for fully achieving the remaining reductions would be to constrain growth, business operations, and personal travel. Absent policy decisions to impose such restrictions, ARB staff believes it is necessary to make use of the new technology provision of the Clean Air Act. For the San Joaquin

Valley, about 10 percent of the necessary reductions would fall in this category. For the South Coast, it would be about 25 percent of the necessary reductions.

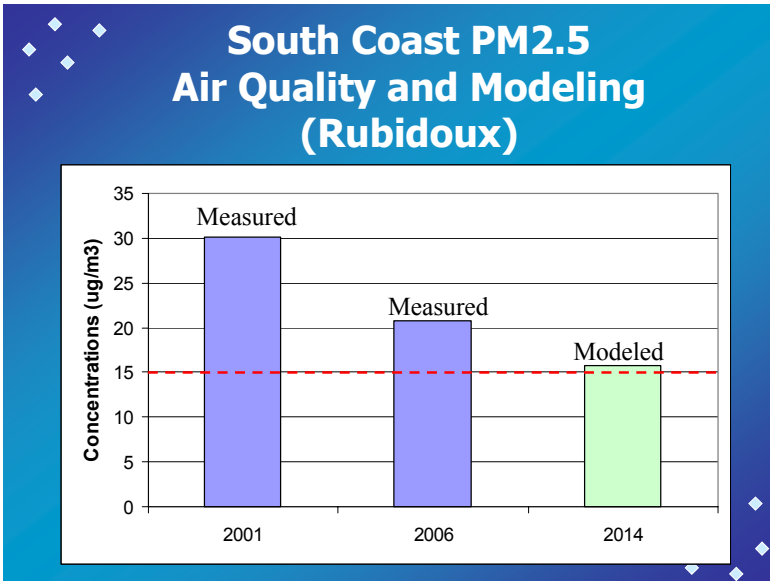
To address concerns about delays in attainment, ARB staff proposes to continue to identify and pursue additional actions that would further accelerate air quality progress. While it is unlikely that the entire ozone attainment gap will be filled without new technology, staff believes additional progress could be made if, for example, more incentive funds became available. Also, as regions move closer to attainment, episodic "spare the air" type programs may be able to provide the final increment of reductions needed a few days per year. Public education and outreach to encourage voluntary actions have historically been key elements of these programs.

South Coast PM2.5 SIP

How the SIP should address the PM2.5 attainment challenge in the South Coast continues to be controversial. The proposed State Strategy along with district measures leaves an emission reduction gap in the South Coast's proposed attainment demonstration of about 70 tons per day of NOx in 2014. The South Coast air district staff has identified a set of measures -- mobile source NOx measures -- for ARB to adopt to close the gap. This would be above and beyond the 451 tons per day of NOx reductions in the proposed State Strategy. ARB staff believes the District's suggested mobile source measures are not feasible without billions of dollars of unidentified subsidies to expedite the introduction of the newer, cleaner diesel vehicles and equipment.

ARB technical staff has reviewed South Coast's proposed PM2.5 attainment demonstration and identified additional local measures to reduce directly emitted particulate matter. ARB staff believes these measures can bridge the gap and achieve the standard by 2014. These measures would reduce emissions from residential wood smoke, restaurant cooking, and dust-generating activities. The ARB staff's analysis and the peer review of the staff methodology are discussed in Chapter 4.

It is important to recognize that the projected gap in reductions is based on a modeling assessment that is more pessimistic than the measured air quality trend. Between 2001 and 2006, the measured PM2.5 annual average dropped from 30 to just over 20 ug/m^3 consistent with the downward emissions trend. If that trend continues, the emission reductions in the proposed State Strategy will be sufficient for attainment. The South Coast predicts that with ARB staff's proposed State Strategy, the highest remaining concentration in 2014 would 15.7 ug/m^3 -- less than one microgram above the 15 ug/m^3 standard. Even if that modeling is correct, ARB's alternative attainment strategy would close that gap.



In light of the measured PM2.5 progress over the past 15 years, and the magnitude of the new emission reductions that will occur, ARB staff believes that the South Coast will attain the PM2.5 standard by 2015 with the mobile source measures in the proposed State Strategy. Nonetheless, to be health protective and meet U.S. EPA SIP modeling requirements, staff believes that additional feasible measures should be pursued. Using the South Coast model, ARB staff found that the proposed local measures for residential wood smoke, restaurant cooking, and fugitive dust would close the apparent gap.

Proposed Action

Staff is recommending that the Board adopt the proposed State Strategy to meet both ozone and PM2.5 attainment needs in the South Coast Air Quality Management District and the San Joaquin Valley Air Pollution Control District at ARB's June 21-22, 2007 public meeting. The State Strategy, in combination with near-term local air district measures, must meet the emission reduction target in each region's attainment demonstration.

The sequence of public meetings to consider the various SIP elements is:

- April 30, 2007 – San Joaquin Valley Air Pollution Control District Governing Board consideration of the San Joaquin Valley Ozone Plan.
- June 1, 2007 (tentative) – South Coast Air Quality Management District Governing Board consideration of the South Coast Air Quality Management Plan.
- June 14, 2007 – ARB consideration of San Joaquin Valley Ozone Plan.
- June 21-22, 2007 – ARB consideration of the proposed State Strategy and South Coast District Air Quality Management Plan for ozone and PM2.5.
- April 2008 – Completion of San Joaquin Valley PM2.5 SIP.

Next Steps

Once local plans and the State Strategy are approved by the local and State governing boards, they are submitted to U.S. EPA for approval.

SIPs are generally updated on a triennial basis for regions with the most persistent air quality problems. When U.S. EPA revises national ambient air quality standards, new SIP planning processes are triggered. U.S. EPA recently tightened its 24-hour PM2.5 standard and is currently reviewing the 8-hour ozone standard. Final U.S. EPA action on the 8-hour ozone standard review is expected by March 2008.

Technical Supporting Documents

By May 7, 2007 – 45 days before the June 21-22, 2007 Board hearing — ARB staff will release these additional elements as an appendix to this document.

- Economic analysis;
- Environmental impacts analysis;
- Detailed emissions data;
- Reasonable Further Progress demonstrations;
- Contingency reductions for progress milestone years; and
- Legal authority and other federally required submittals.